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ABSTRACT

This study examined the relationship between students' socioeconomic characteristics and qualification for a merit scholarship in a new, state-run program. The Michigan merit award scholarship program provides scholarships of up to $2,500 for students who score at Level 1 or 2 of the Michigan Educational Assessment Program High School Tests. Eleventh graders who took these tests in the spring of 1999 were the first cohort eligible for the scholarships, to be given when they enrolled in 2000 or later. The program relies on funds from the state's tobacco settlement. Michigan's would be the largest state merit award program to rely on standardized instruments as the sole criterion for scholarship eligibility. Data were from the Michigan Department of Education. The study found that White, Asian American, and female students, and those in wealthier communities, were likely to be awarded a disproportionate number of scholarships. These findings suggest that the scholarship program will be unlikely to meet the goal of increasing access to higher education in the state. (Contains 4 tables, 3 figures, 9 endnotes, and 40 references.) (SLD)

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High-Stakes Testing and State Financial Aid:

Evidence From Michigan

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Abstract

This study examines the relationship between students' socioeconomic characteristics and qualification for a merit scholarship in a new, state-run program. The study finds that White, Asian American, and female students, and those in wealthier communities, will be awarded a disproportionate number of scholarships, and that the scholarship program is unlikely to meet the goal of increasing access to higher education in the state.

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High-Stakes Testing and State Financial Aid: Evidence From Michigan

Introduction

Financial assistance for individuals attending college has existed in this country almost as long as higher education itself. Holtschneider (1997), McPherson and Schapiro (1998), and Wick (1997) describe how scholarships were established in a number of colleges as early as during the colonial era and in the 19th century. The earliest scholarships were often awarded based on the academic merit of individual students, with some consideration given to financial need (Hauptman, 1990)

This practice was carried on into the 20th century largely by the private elite colleges and universities in the eastern part of the country. Recognizing the inequities of this system, and with no common method for determining financial need, many of the elite private institutions banded together in 1954 to establish the College Scholarship Service (CSS) as part of the College Entrance Examination Board. The CSS developed a formula for institutions to share to help determine the financial need of their applicants. With this action, most private institutions shifted their awarding of scholarships to a system based on family financial need.

This emphasis on financial need in determining eligibility for undergraduate scholarships was recognized by the federal government with the passage of the Higher Education Act of 1965, which implemented the Educational Opportunity Grant program (the precursor to Pell Grants). The states followed suit as state-funded scholarship funds grew after creation of the State Student Incentive Grant (SSIG) program. Created as part of the 1972 reauthorization of the Higher Education

Act, the SSIG program provided matching federal funds to states that funded their own scholarship programs. The great majority of these state scholarship funds were awarded based on financial need.

Since the 1980s, however, the use of financial need as the basis for awarding scholarships by the states has been eroding. Between 1982 and 1999 spending on need-based scholarships for undergraduates by the states increased 7.3 percent annually, while spending on merit programs increased at a 12.7 percent annual rate. The proportion of state grants awarded based on merit has risen from 9.0 percent to 18.6 percent during this period (Heller, in press).

There are numerous examples of state merit scholarship programs that have been created in recent years. The most well known is the Helping Outstanding Pupils Educationally (HOPE) program in Georgia. Begun in 1993, it has grown to become the largest state-run merit scholarship program in the country, awarding $189 million in the 1998/1999 academic year (Heller, in press). The primary academic criteria used for the awarding of HOPE scholarships is the attainment of a B average (3.0 on a 4.0 scale) in a selection of high school core curriculum subjects (Mumper, 1999).

Looking to duplicate the popularity of the HOPE program among Georgia voters,[1] Governor John Engler of Michigan announced in his 1999 State of the State Address that he would introduce legislation to create the Michigan Merit Award, "for all Michigan high school graduates who master reading, writing, math and science" (Engler, 1999). Engler proposed that the program be funded from a portion of the state's share of tobacco settlement funds. The bill quickly passed both houses

of the Michigan legislature and the Michigan Merit Award Scholarship Act was signed into law by Engler on June 30, 1999. The legislation created the Michigan Merit Award Board to implement the program, with the stated goal of the Board "to increase access to postsecondary education and reward Michigan high school graduates who have demonstrated academic achievement" ("Michigan merit award scholarship act," 1999).

The Act provides scholarships of up to $2,500 for students who score at Level 1 (exceeds Michigan standards) or Level 2 (meets Michigan standards) on all four portions of the Michigan Educational Assessment Program High School Tests (MEAP HST). The tests are given in four subject areas: mathematics, reading, science, and writing.[2] All students in Michigan, regardless of family income or other characteristics, are eligible for the awards.[3] Eleventh graders who took the HSTs in the spring of 1999 (before passage of the legislation) are the first cohort of students eligible for the scholarships, to be awarded when they enroll in college in the fall of 2000 or later. Funding for the program was set by the legislation at 30 percent of the tobacco settlement total in fiscal year 2000, 50 percent in 2001, and 75 percent in 2002 and subsequent years.

Michigan's Merit Award Scholarship, however, differs significantly from those of other states. Most other states, like Georgia's HOPE scholarship program, use high school grade point average, or some combination of grade point average and other criteria, such as standardized test scores, to determine scholarship eligibility. Michigan's is the largest state merit award program to rely on standardized instruments as the sole criterion for scholarship eligibility. Thus, the

experience in Michigan provides an excellent opportunity to measure the impact of high-stakes testing as a criterion in the awarding of financial aid for college.

This study analyzes the MEAP results of the first cohort of eligible students in Michigan to address the following questions:

1. How did qualification for the Michigan Merit Scholarships differ for individuals with different socioeconomic characteristics?
2. How do these various characteristics jointly relate to scholarship qualification?
3. Is the Michigan Merit Scholarship Program, through its use of high-stakes testing, likely to achieve the legislatively-mandated goal of increasing access to higher education in the state?

Literature Review

There are two primary bodies of literature that are relevant to the questions in this article. The first includes those studies that examine the relationship between students' socioeconomic characteristics and the results of standardized tests. The second body includes the literature on the effectiveness of financial aid in promoting access to college for different populations of students.

Studies of high school students that have looked at student characteristics such as race, ethnicity, or socioeconomic status (SES) have consistently found strong relationships between those constructs and performance on standardized tests. Significant achievement gaps between White and Asian American students on one hand, and Hispanic and African American students on the other, or between high

SES students and low SES students, have been identified. These gaps persist regardless of what specific learning outcome is measured, or whether the analysis is conducted at the level of individual students within schools or at the level of the schools themselves.

At the national level, the standard reports come from the National Assessment of Educational Progress (NAEP), which has been administered by the U.S. Department of Education for students in grades 4, 8, and 12 since 1969. Comparing student racial subgroups on the reading component of the 1998 NAEP, for example, Donahue, Voekl, Campbell, and Mazzeo (1999) reported that the average reading scores for White students was higher than that for African American, Hispanic, and Native American students at all grade levels tested. Similar results have been found for the other components of the test, including mathematics, science, and writing (Greenwald, Persky, Campbell, and Mazzeo, 1999; O'Sullivan, Reese, and Mazzeo, 1997; Reese, Miller, Mazzeo, and Dossey, 1997). A number of researchers have synthesized data from various Education Department reports to draw further conclusions. Lee (1998) for example, organized achievement gaps from the NAEP mathematics test into four dimensions, pairing the within- and between-school levels with each of the categories of race and SES. His results, focusing on state policy correlates of gaps from the 1992 NAEP, indicate that while the existence of the gaps is universal, their size and the significance of the independent variables varies among different states. Sedlacek (1995) used hierarchical linear modeling to simultaneously weigh both within-and between-school effects, finding similar racial linkages to achievement across subject areas,

and when controlling for gender, SES, and course-taking patterns. Bruschi and Anderson (1994), looking specifically at science achievement on the 1990 NAEP, also confirmed large differences between White, Hispanic, and African American groups across science content areas.

The linkages between academic achievement and SES have been less well documented, largely because SES is more difficult to measure than race. One measure of poverty, student eligibility for free or reduced lunches through the National School Lunch Program, has been collected as part of the NAEP dataset only since 1996. Donahue et al. (1999) found that students who were eligible for the free and reduced-price lunch program had lower average reading scores than students who were not eligible for the program, at all grade levels tested. Of course, race and SES are highly correlated, both within and among schools (Orfield, 1994), urging caution on researchers who attempt to deal with both constructs. Stevens and Grymes (1993) emphasizes that student subgroup achievement differences cannot be attributed to the subgroup identification itself, but rather that a complex array of factors such as opportunities to learn and socio-cultural environment combine to affect students' academic performance. One study that has attempted to parse the separate effects of race and SES is Hedges and Nowell's (1999) meta-analysis of seven previous studies (all of which used nationally-representative samples of high school students from 1965 to 1996). This study found that about a third of the African American-White racial gap in test scores is attributable to SES differences between the races. They also show that, while the gap is smaller at the bottom 5 percent and 10 percent of the test-score distribution (indicated by over-representation of African

Americans), the top of the distribution shows a much larger gap: a hugely disproportionate under-representation of African Americans relative to Whites. Unlike economic status at the student level, however, school-level resources have generally not been found to correlate with student performance (Gaudet, 1994; Sedlacek, 1995).

Results for gender subgroups, by contrast, are somewhat mixed depending on subject area and grade level. Donahue et al. (1999) found that girls had higher reading scores than boys at all grade levels. Bruschi and Anderson (1994) found that 17 year-old girls' achievement lagged that of boys in physical sciences and earth and space sciences, but surpassed that of boys in the life sciences and the nature of science (a content area that includes processes, principles, and knowledge of scientific method). Sedlacek (1995) reported that 12th grade boys had higher achievement than their female peers in mathematics.

There is a long and rich history of research studies that have examined the effectiveness of financial aid on influencing the decisions that potential students make about enrolling in college. This research is often referred to as "student price responsiveness," "student demand," or "student price elasticity" studies. Reviews of much of this research have been published over the last three decades by (Heller, 1997; Jackson and Weathersby, 1975; Leslie and Brinkman, 1988).

While these studies have utilized a broad range of research methodologies, have used different samples of students, and have been conducted at different times, there are two conclusions that have generally been reached by researchers. First, different types of financial aid awards have varying impacts on college enrollment

behavior. In general, grants tend to have a stronger influence on college enrollment than do student loans or work study awards of the same magnitude.

Second, students with varying characteristics have differing enrollment reactions to changes in the amount of financial aid offered. In general, African American, Hispanic, and low income students tend to be more price responsive (i.e., are more likely to enroll in college, or change the type of institution in which they enroll) than are White and middle- and upper-income students.

A couple of examples illustrate these effects. St. John (1990) analyzed the High School and Beyond sophomore cohort to examine the effects of tuition and financial aid increases on the college enrollment decisions of graduating high school students. He found that for low-income students, their enrollment response to a $100 increase in grant aid was over twice the response to a $100 decrease in the tuition price. In addition, the enrollment response of these students was over twice as large as the grant and tuition sensitivity of higher-income students. Heller (1999a) examined the public higher education enrollment response of different racial groups to increases in state grant spending. He found that the enrollment response of African Americans to increased state grant spending was approximately 3.7 times as large as White students, and that of Hispanics was 2.8 times as large as Whites.

Methodology

The data used in this study are from three sources. In the fall of 1999, the Michigan Department of Education released a datafile with the spring Michigan

Educational Assessment Program (MEAP) High School Test (HST) results (National Computer Systems, 1999). The datafile contains information about each student, including racial/ethnic background, gender, school attended, and test results. These data are used by the Michigan Merit Award Board to determine scholarship eligibility. The file includes data on 124,350 students who took the HST tests in the Spring of 1999. The MEAP data set includes raw and scaled test scores for each of the four subtests (reading, writing, mathematics and science). It also records the coded performance level, based on established cutoff points from the scaled scores, to indicate whether the student has "met" or "exceeded" the Michigan achievement standard for each subject area. Each student's self-reported racial category and gender is also recorded.

The second data source is the school-level data from the 1999 Michigan School Report (MSR), which includes 704 of the high schools represented by the students in the MEAP dataset (Michigan Department of Education, 1999b). The MSR data set provides the percentage of students in each school who qualified for free or reduced-price lunch under the National School Lunch Program (NSLP) as of December, 1998 (herein designated as "free lunch"). Since eligibility for NSLP is determined by a federal formula of family size and income, this percentage is an indicator of the income levels of families in the school's district. A final dataset, the Michigan DOE's Building Enrollments file for Fall 1998, provides the overall racial and gender makeup for each school (Michigan Department of Education, 1999a).

The first research question is answered using bivariate data analysis techniques. We compare the percentage of students who qualified for the

scholarship from each demographic category with the percentage of students who took all four of the subject area tests in that category. The distribution of students with different background characteristics among scholarship qualifiers indicates which students in the state are benefiting most from the scholarship program. Over- or under-representation of scholarship qualifiers relative to test-takers indicates an imbalance in the awarding of scholarships.

The second portion of the analysis uses multiple regression techniques to assess the joint relationships of the student and school characteristics to scholarship qualification. Since we are interested primarily in the likelihood of a student with given characteristics qualifying for a scholarship, we limited this analysis to only those students who actually completed all four of the required subject tests. We further reduced the dataset to those students whose schools reported free lunch data and those students who self-reported their race and gender.

Most previous studies have relied on ordinary least squares regression or hierarchical linear modeling (HLM) to correlate an interval-scaled outcome variable – standardized test scores – with the various student background predictors. The present study takes a different approach, however, by considering the effect of the predictors on a dichotomous outcome (qualifying or not qualifying for a scholarship) that results from a more-or-less arbitrary cutoff point in the scaled test scores. For this analysis we use logistic regression techniques. Logistic regression is an appropriate multivariate technique for this analysis because of the dichotomous distribution of the outcome variable in the study (Cabrera, 1994; Kleinbaum, Kupper, and Muller, 1988).

As other researchers have pointed out, the African American-White gap in achievement test scores is largest near the top of the distribution (Hedges and Nowell, 1999). If the same holds true for the MEAP tests, then since the break-point for the Michigan Merit Award Scholarships is near the top of the achievement scale, the racial gap in the program's outcomes should be larger than overall averages of scaled scores would suggest. Logistic regression, by correctly modeling this high break-point for a dichotomous outcome, will more accurately reflect the resulting racial gap in the awarding of scholarships than would an OLS or HLM technique that looks only at the scaled test scores.

As in ordinary least squares, standard logistic regression assumes that the observations in the sample are independent of one another. The data in this study do not meet this restriction, however, because the school-level free lunch data are not independent for students within each school. To account for this, the logistic regression models were fit using Huber/White estimators of variance, which allow observations that are not independent from one another (Huber, 1967; White, 1980, 1982). These "relaxed" standard errors allow for the correlated observations of free lunch percentage within schools.

The general model fit in this study is:

$$P(Y_i) = \frac{\exp(\beta_0 + \beta_1 F_i + \beta_2 R_i + \beta_3 S_i + \beta_4 F_i R_i)}{1 + \exp(\beta_0 + \beta_1 F_i + \beta_2 R_i + \beta_3 S_i + \beta_4 F_i R_i)} \quad (1)$$

where

$P(Y_i)$ = Probability of student i qualifying for a scholarship

F_i = Percent free lunch students in school attended by student i

R_i = Vector of dummy variables for race of student i (White omitted)

S_i = Sex of student *i* (female omitted)

F_iR_i = Vector interacting race dummy variables with school free lunch percentage

The model in Equation 1 was fit by sequentially entering variables in blocks, with the first block being the school-level variable, the second block the individual characteristics, and the third block school and individual characteristics jointly. A fourth model was fit which added the interaction between race and the free lunch percentage in the school, in order to test whether the effect of race on the outcome differed for students in wealthier versus poorer districts.

The effect of each predictor on the outcome is expressed as a Delta-*p* statistic, recommended by Petersen (1985) as a method for expressing the relationship between a unit change in a predictor and the estimated percentage change in the outcome.[4] The Delta-*p* statistic is calculated as:

$$\text{Delta-}p = \frac{\exp(L_1)}{1+\exp(L_1)} - \frac{\exp(L_0)}{1+\exp(L_0)} \tag{2}$$

where

$$L_0 = Ln\left(\frac{\bar{Y}}{1-\bar{Y}}\right) \tag{2.1}$$

$$L_1 = L_0\beta_x \tag{2.2}$$

For example, a Delta-*p* value of 0.025 indicates that a one unit change in the predictor is related to a 2.5 percentage point increase in the likelihood that a student would receive a Michigan Merit Award Scholarship.

In addition to the Delta-*p* measure, additional statistics shown for each model are: 1) the outcome mean for the observations included in the model; 2) the number of observations included in the model; 3) the percentage of cases properly classified as either receiving or not receiving a grant (using a 0.5 cutpoint); and 4) a χ^2 test of the model fit. Also shown is a pseudo R^2 statistic, calculated as:

$$Pseudo\ R^2 = 1 - \left(\frac{\text{Model log likelihood}}{\text{Intercept – only log likelihood}} \right) \quad (3)$$

The pseudo R^2 statistic shown in Equation 3 represents the proportion of the error variance reduced by a particular model in comparison to one that includes an intercept only.

Results

Bivariate Results

In the 1999 HST tests, 124,350 Michigan students took at least one of the four subtests, and 53 percent (66,419) of these took all four subtests. Table 1 presents the test results for students of different racial/ethnic backgrounds and genders.

[Table 1 here]

Michigan is primarily a biracial state; almost 90 percent of the students taking at least one of the HST tests in 1999 were White or African American (for students

with a valid race/ethnicity in the test file).[5] While Whites represented 70 percent of all students taking at least one test (column G in Table 1), they made up almost 88 percent (column H) of all scholarship qualifiers. African American students were the most under-represented; while 19 percent of all test takers were African American, they qualified for only 3.1 percent of the scholarships. These results are not surprising given the evidence of the relationship between race/ethnicity and standardized test scores that was described earlier. Female students, who were just over half of all students taking at least one of the HST subtests, represented 56 percent of all scholarship qualifiers. An ANOVA analysis of the scholarship qualification rates among the racial/ethnic groups and between the genders determined that the differences were statistically significant different from zero at a level of $p \leq .001$.

The difference between the racial distributions of students who took the test and those who qualified for a Michigan Merit Award Scholarship can be seen in Figure 1. White and Asian/Pacific Islander students were clearly over-represented among scholarship qualifiers, while students from the other groups were under-represented.

[Figure 1 here]

Table 2 shows the distribution by the percentage of students qualifying for free lunch in each student's school. The approximately 700 secondary schools in Michigan were divided into quintiles, with the first quintile representing the

schools with the highest percentage of students on free lunch. As can be seen there is a strong inverse relationship between the income level of the students in a school (as measured by the free lunch percentages) and the qualification for the scholarships: the lower the percentage of students on free lunch, the greater is the percentage of students qualifying for scholarships. Figure 2 illustrates this relationship graphically. An ANOVA analysis of the scholarship qualification rates among the free lunch quintiles determined that the differences were statistically significant at a level of $p \leq .001$. It is interesting to note that, by combining the two lowest free lunch quintiles in Table 2, we find that more than half of the scholarships (53.9%) are being awarded to students who attend schools in which fewer than 10 percent of the student body qualifies for the free lunch program.

[Table 2 here]

[Figure 2 here]

Multivariate Results

Table 3 presents the results of fitting the logistic regression models. The first model fitted includes the school free lunch percentages alone; it indicates that a 10 point increase in the percentage of students on free lunch at a school corresponds to a 7 point decrease in the probability that a student in the school will earn a scholarship. The model correctly predicts the outcome of 69.2 percent of the cases, approximately the same percentage of all of the models fitted.

[Table 3 here]

The second model examines the effects of the individual characteristics on the probability of receiving a scholarship. Note that the omitted category for race is White students, and for gender, female students. Asian Americans are the only racial group who are predicted to have a higher probability (by 5.6 percentage points) of earning a scholarship than are White students. The other groups are all predicted to have a lower probability than Whites, ranging from African Americans (23.9 points below) to multiracial students (7.5 points below). Male students are predicted to qualify for a scholarship at a rate 4.8 percentage points below females.

The third model includes both school and individual level characteristics. Although including these variables jointly tends to mitigate the effects of each shown in the first two models (i.e., all the Delta-*p* statistics, with the exception of that for gender, diminish in absolute value), the effects are still in the same direction. Once again, attending a school with a higher percentage of students on free lunch is related to a reduced probability of qualifying for a scholarship, after controlling for the individual characteristics included in the model. Asian Americans and females are still predicted to have a higher qualification rate than Whites and males. The gap between the White qualification rate and that of the other racial groups ranges from almost 20 points for African American students to 4.2 points for multiracial students.

The last model builds on the previous one by including the interaction terms.[6] The effects of race and gender are largely the same as in the previous model,

though the magnitude of each is slightly different (the effect of being in the multiracial category is no longer significantly different from zero). Only two of the interactions are found to be significant predictors of the probability of earning a scholarship. The effect of being in a poorer school (those with higher percentages of free lunch students) on the probability of qualifying for a scholarship is greater for Asian Americans and Hispanics than for students of other races. Every 10 point increase in the percentage of students on free lunch in the school is related to an additional seven point decrease in the scholarship qualification rate for Asian Americans and a three point drop for Hispanics, beyond the overall effect of the poverty status of the school on all students.

Discussion

The results presented here demonstrate that there are important differences in the rate at which students qualify for the Michigan Merit Award Scholarships, and that these differences are correlated with both school and student socioeconomic characteristics. These effects can best be demonstrated by examining them visually. Figure 3 illustrates the predicted probability of qualifying for a scholarship at varying levels of school free lunch percentage, for males of different racial backgrounds.

[Figure 3 here]

The inverse relationship between the free lunch percentage of students in the school, and the probability that a student in that school would qualify for a scholarship, can be clearly seen. As the proportion of students on free lunch increases, the predicted probability of qualifying for a scholarship decreases for all students. For Asian American and Hispanic students, the rate of decrease is greater due to the interaction effect described in the previous section. At school free lunch percentage levels exceeding approximately 20%, Asian American students are no longer predicted to have a scholarship qualification rate exceeding that of Whites. Students in the poorest schools – those with the most free lunch recipients and the most financial need – have a predicted probability of qualifying for a scholarship that approaches zero, a result also borne out by the bivariate analysis (Table 2).

Figure 4 presents the same information for female students. Again, the relationship between school poverty level and the probability of scholarship qualification is clear. The gender effect can be seen by comparing the curve for each racial group with its corresponding curve in Figure 3. For every group, and at every school poverty level, females have a higher predicted scholarship qualification rate.

The analysis to this point has answered the first two research questions of this study. There is a clear relationship between race, gender, school poverty level, and the probability of qualifying for a Michigan Merit Award Scholarship. The findings are consistent with the prior research on standardized tests and the socioeconomic characteristics of the students taking them.

The question left unanswered so far is the third research question: Is the Michigan Merit Scholarship Program likely to achieve the goal of increasing access to higher education in the state? Since the first cohort of students eligible for the scholarships is just now enrolling in college, the answer cannot yet be determined with absolute certainty. However, the findings of this study do allow us to prospectively answer the question as can best be determined with the evidence available.

The body of research that has examined the relationship between students' socioeconomic characteristics and postsecondary educational attainment is very clear.[7] African American and Hispanic students, and students of all races from poor families, enroll in and graduate from college at lower rates than do wealthier students and White and Asian American students. These findings are generally consistent across different institutional sectors, over time, and in different regions of the country.

While there is limited evidence on educational participation and attainment rates in individual states, there is some to indicate that the patterns in Michigan mirror at least in part the broader national trends. Analyses of data from the Current Population Survey, conducted by the U.S. Bureau of the Census, indicate that there is a gap in the college completion rates of White, African American, and Hispanics in Michigan (Day and Curry, 1998). While 22.8 percent of Whites had completed a bachelor's degree or more in 1998, only 11.6 percent of African Americans and 7.7 percent of Hispanics had attained the same level of postsecondary education.[8]

In conjunction with a published study examining the college participation rates of students from different racial/ethnic groups, Heller (1999b) calculated the college participation rates of these groups in each state using enrollment data from the Integrated Postsecondary Education Data System, and population data from the U.S. Census Bureau. He found that in Michigan, the undergraduate college participation rates of Whites was 50 percent higher and Asian Americans 100 percent greater than that of both African Americans and Hispanics (personal communication). These differences in college participation rates mirrored the national trends.

Mortenson (1999) examined the college participation rates of students 18 to 24 years old in four income quartiles nationally. In 1997, students in the top quartile (family income above $74,583) had a college participation rate of 88.8 percent, i.e., 88.8 percent of all 18 to 24 year-olds in this group had attended at least one year of college. For students in the lowest quartile (income below $25,064), the participation rate was 53.2 percent. Mortenson found similar gaps in the college completion rates by income quartile.

If the Michigan Merit Scholarship Program is to achieve its stated goal of increasing college access in the state, it would have to focus the awards on those students whose college enrollment decisions would most be influenced by the awarding of grant aid. *Our findings, however, demonstrate that the scholarships will be awarded disproportionately to those students who are most likely to be attending college anyway, even without the grant assistance, based on the conclusions in the college access literature – Whites, Asian Americans, and students*

in wealthier school districts. There may be a slight effect on college access, as there is a very small number of students who qualified for scholarships who fall into the college access "at risk" categories.[9] However, the data show that the vast majority of the awards will go to students who, based on the existing evidence, would be predicted to attend college even without the scholarship.

Given the current structure of the Michigan Merit Scholarship Program and the results from the first cohort of eligible students, there is little evidence to support the view that the program will help to improve college access in Michigan. The state could more effectively improve college access by distributing the funds to those students who are least likely to attend college without such assistance.

TABLE 1
1999 MEAP HST Results by Racial/Ethnic Group and Gender

	A	B	C	D	E	F	G	H	I
Race	Total # of students	# taking all 4 tests	% taking all 4 tests (B/A)	# qualifying for scholarship	% of total qualifying for scholarship (D/A)	% of eligible qualifying for scholarship (D/B)	% of all students with known race or gender	% of all scholarship qualifiers	Percentage points over/(under) represented (H-G)
Native American	942	537	57.0%	104	11.0%	19.4%	1.1%	0.7%	(0.4)
Asian/Pacific Islander	1,719	1,068	62.1%	424	24.7%	39.7%	2.1%	2.9%	0.8
African American	15,916	6,388	40.1%	448	2.8%	7.0%	19.2%	3.1%	(16.1)
Hispanic	2,121	1,175	55.4%	239	11.3%	20.3%	2.6%	1.7%	(0.9)
White	58,081	37,458	64.5%	12,710	21.9%	33.9%	70.2%	87.8%	17.6
Multiracial	1,691	966	57.1%	248	14.7%	25.7%	2.0%	1.7%	(0.3)
Other	2,283	1,288	56.4%	306	13.4%	23.8%	2.8%	2.1%	(0.7)
Missing	41,597	17,539	42.2%	5,659	13.6%	32.3%	—	—	—
Gender									
Female	61,460	34,734	56.5%	11,309	18.4%	32.6%	50.2%	56.2%	6.0
Male	60,882	31,573	51.9%	8,800	14.5%	27.9%	49.8%	43.8%	(6.0)
Missing	2,008	112	5.6%	29	1.4%	25.9%	—	—	—
Total	124,350	66,419	53.4%	20,138	16.2%	30.3%	100.0%	100.0%	

TABLE 2
1999 MEAP HST Results by School Free Lunch Quintile

School free lunch quintile (range, median)	A Total # of students	B # taking all 4 tests	C % taking all 4 tests (B/A)	D # qualifying for scholarship	E % of total qualifying for scholarship (D/A)	F % of eligible qualifying for scholarship (D/B)	G % of all students with known lunch data	H % of all scholarship qualifiers	I Percentage points over/(under) represented (H-G)
1st (31.85% - 100%, 50.8%)	23,551	9,331	39.6%	1,459	6.2%	15.6%	19.8%	7.3%	(12.5)
2nd (17.01% - 31.65%, 23.5%)	23,786	13,433	56.5%	3,211	13.5%	23.9%	20.0%	16.2%	(3.8)
3rd (9.85% - 16.99%, 13.0%)	23,716	14,631	61.7%	4,483	18.9%	30.6%	19.9%	22.6%	2.6
4th (4.53% - 9.65%, 7.1%)	23,821	14,137	59.3%	5,156	21.6%	36.5%	20.0%	26.0%	5.9
5th (0.28% - 4.47%, 2.5%)	24,027	12,866	53.5%	5,550	23.1%	43.1%	20.2%	27.9%	7.7
Missing	5,449	2,021	37.1%	279	5.1%	13.8%	—	—	—
Total	124,350	66,419	53.4%	20,138	16.2%	30.3%	100.0%	100.0%	

Note: The size of each quintile is not exactly 20% of the total due to the number of students right at each cutpoint.

TABLE 3
Logistic Regression Results: Delta-*p* values

Outcome = Probability (*p*) of Receiving a Scholarship

Variable	Model 1 School	Model 2 Individual	Model 3 School & Individual	Model 4 School, Individual, & Interactions
% free lunch in school	-0.007***		-0.006***	-0.005***
Native American		-0.132***	-0.111***	-0.092**
Asian American		0.056**	0.054**	0.141***
African American		-0.239***	-0.198***	-0.164***
Hispanic		-0.124***	-0.094***	-0.049*
Multiracial		-0.075***	-0.042*	-0.001
Other race		-0.091***	-0.082***	-0.070***
Male		-0.048***	-0.052***	-0.052***
Free lunch X Native American				-0.002
Free lunch X Asian American				-0.007***
Free lunch X African American				-0.003
Free lunch X Hispanic				-0.003**
Free lunch X Multiracial				-0.003
Free lunch X other race				-0.001
Outcome mean	0.308	0.296	0.302	0.302
Number of observations	64,398	48,834	47,108	47,108
Pseudo R^2	0.036	0.045	0.060	0.061
% of cases properly classified	69.2%	70.4%	69.8%	69.9%
χ^2	207.61***	419.99***	513.96***	529.40***

* p≤.05 ** p≤.01 *** p≤.001

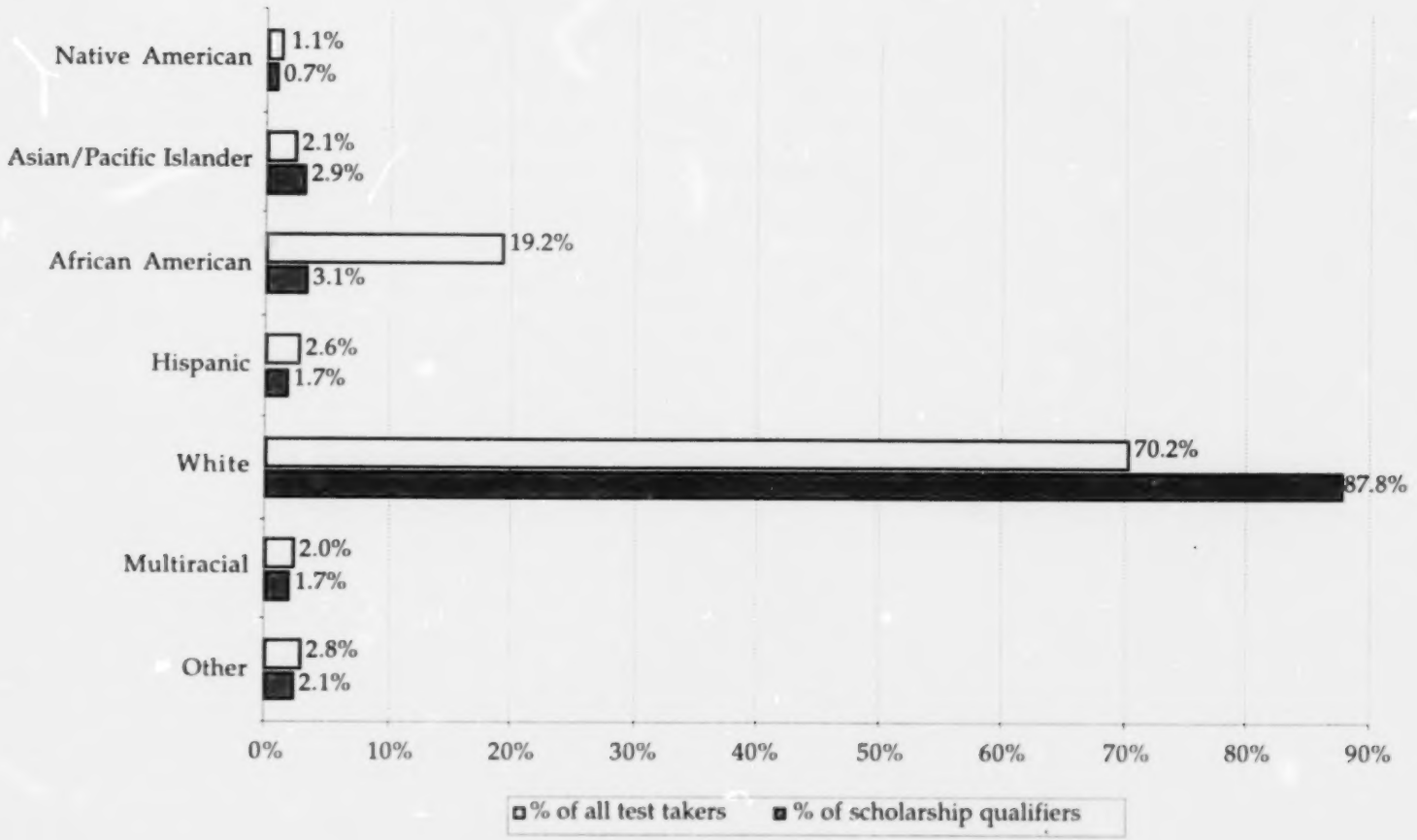
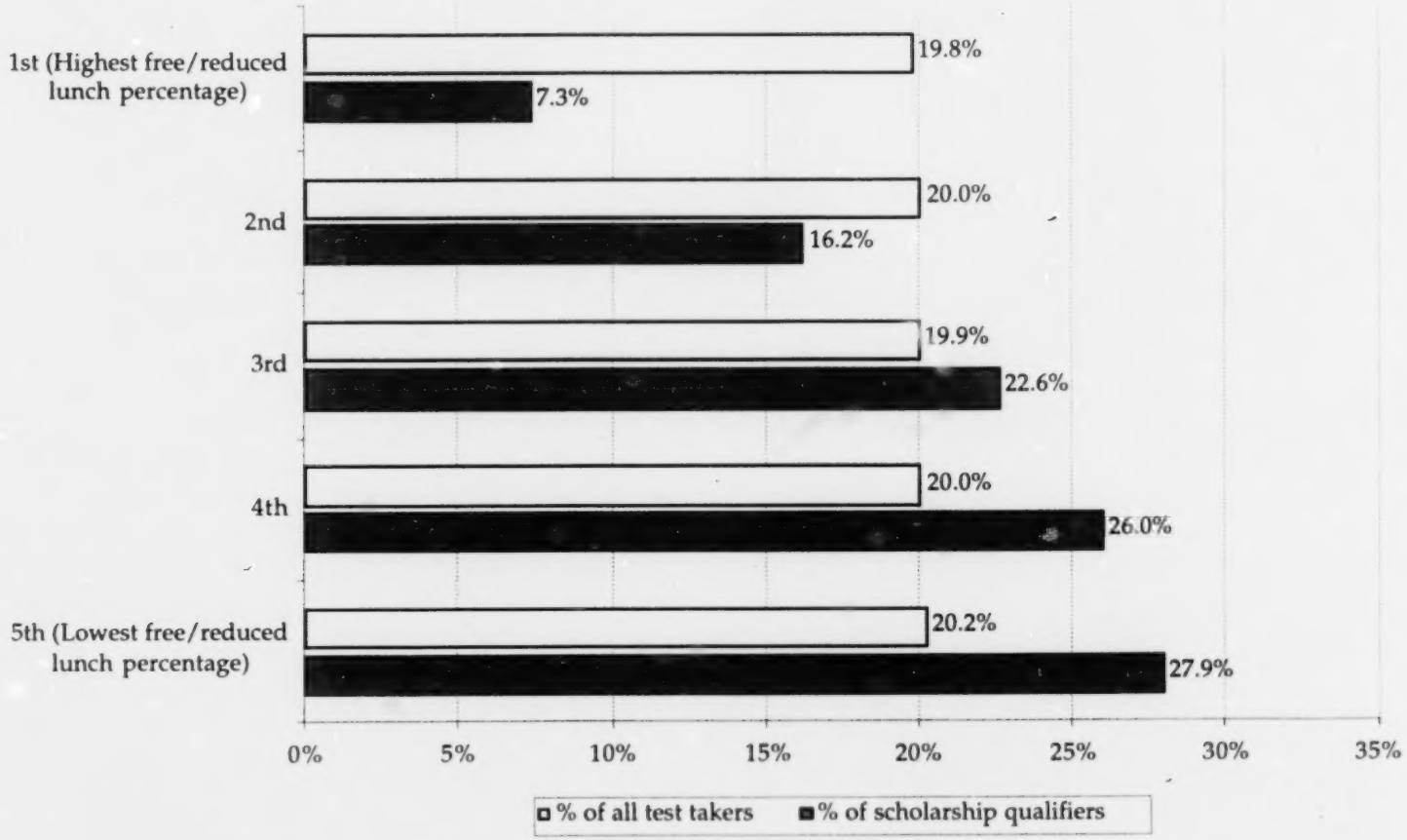


FIGURE 1: *Distribution of students taking at least one test and scholarship qualifiers – by racial/ethnic group*



Note: The size of each quintile is not exactly 20 percent of the total due to the number of students right at each cutpoint.

FIGURE 2: *Distribution of students taking at least one test and scholarship qualifiers – by school free lunch quintile*

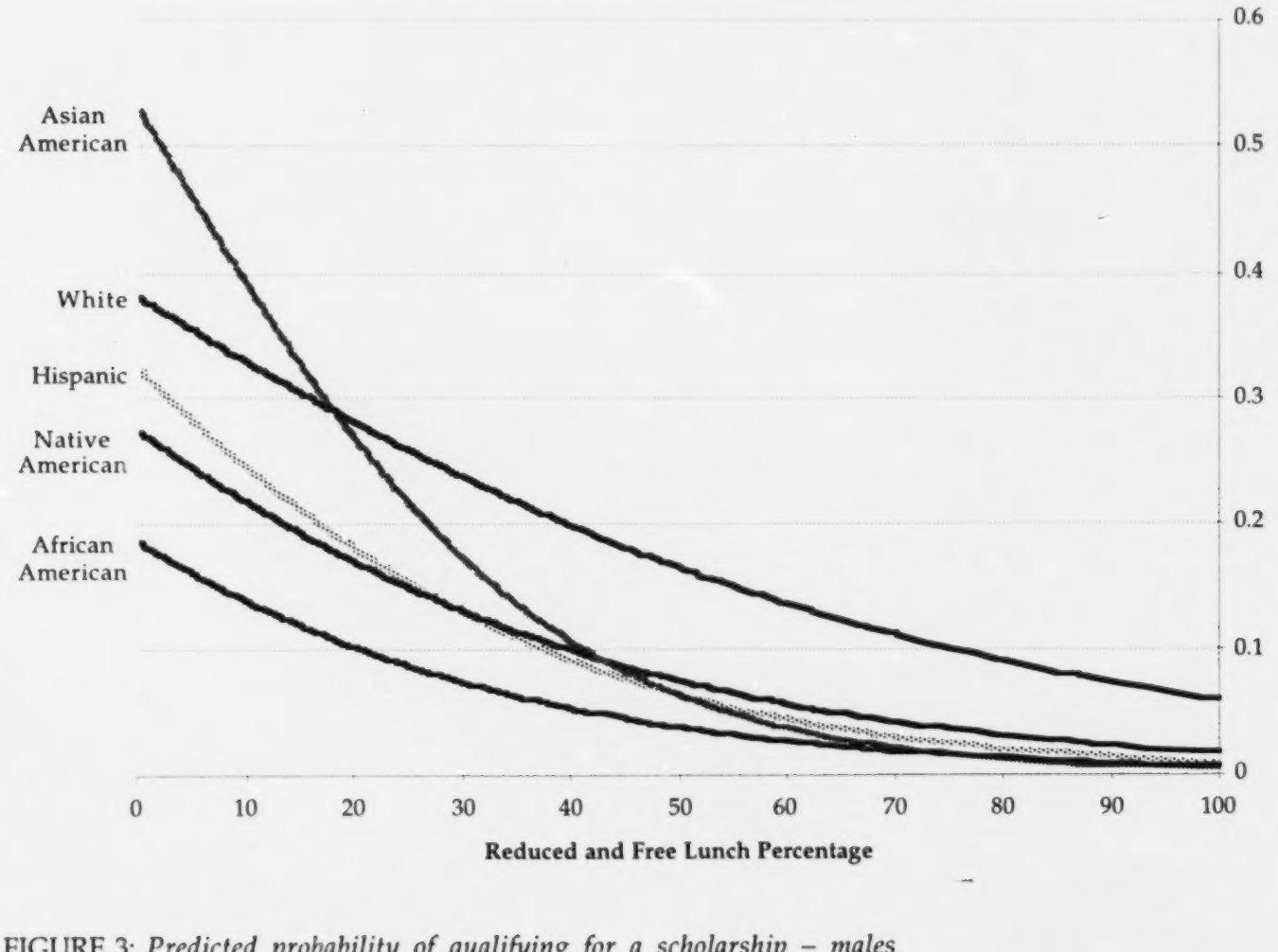


FIGURE 3: *Predicted probability of qualifying for a scholarship – males*

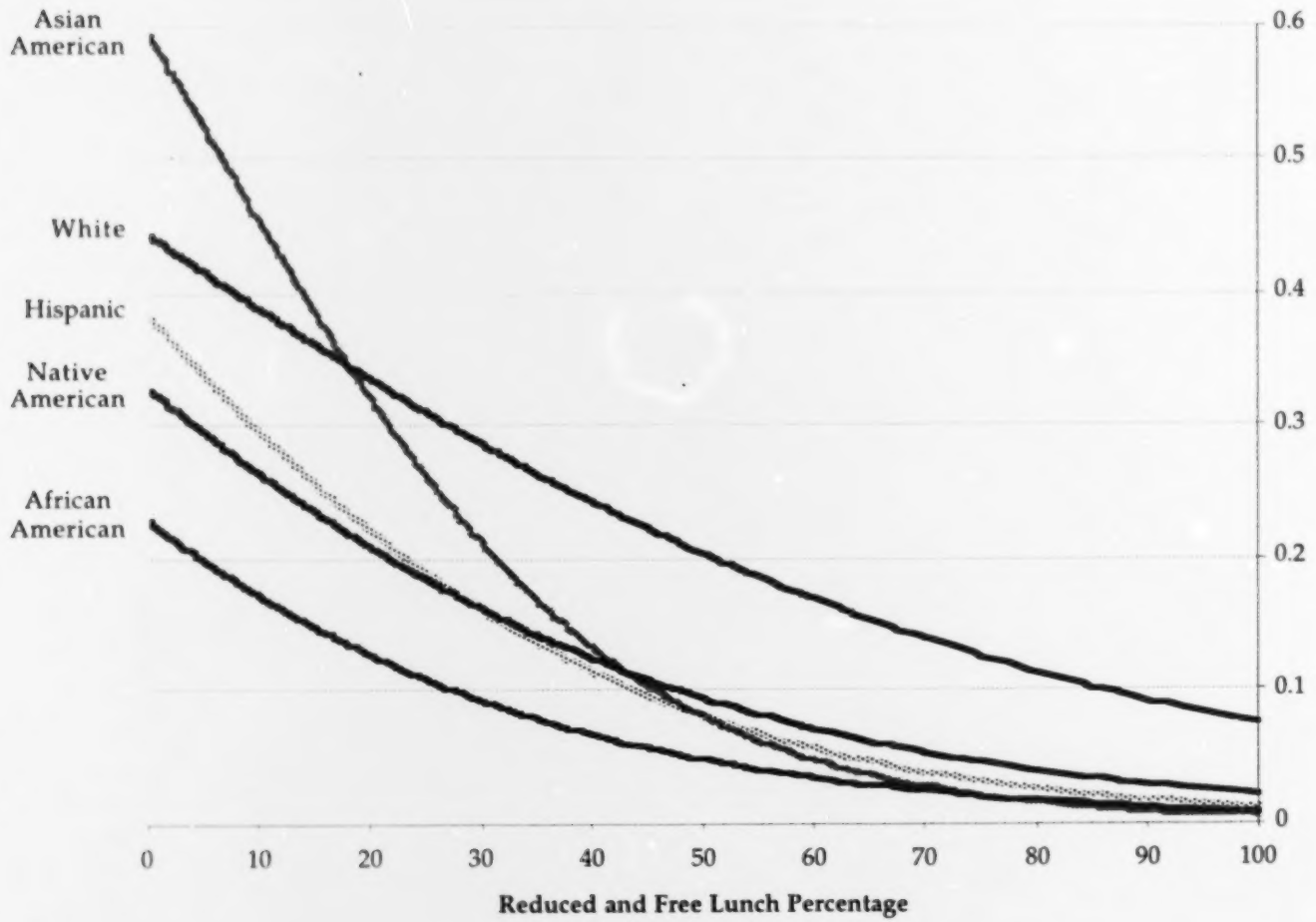


FIGURE 4: *Predicted probability of qualifying for a scholarship – females*

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Notes

[1] The proposal for the HOPE program was introduced during the first gubernatorial campaign in 1990 of former Governor Zell Miller of Georgia, and was widely seen as being a key factor in his victory (Mumper, 1999).

[2] The law provides alternative methods for earning a scholarship, including scoring above certain levels on ACT or SAT standardized tests, but it is expected that most students will attempt to qualify for the scholarships by taking the MEAP tests.

[3] The full $2,500 scholarship is awarded for students attending college or some other form of postsecondary training in Michigan. Students attending out-of-state institutions are eligible for a $1,000 award. In addition to these awards, students achieving certain scores on the 7th and 8th grade MEAP tests are eligible for up to an additional $500 in scholarship funding.

[4] The logistic regression coefficients and Huber/White standard errors for each model are available from the authors.

[5] Students self-reported their race/ethnicity on the MEAP tests. There is no way to discern the race or ethnicity of the students marked as "missing" in the HST file. However, the distribution of the groups in the HST file can be compared to the distribution of all 11th graders as reported by the Michigan Department of Education (Michigan Department of Education, 1999a):

Group	% in HST file	% all 11th graders
Native American	1.1%	1.1%
Asian/Pacific Islander	2.1%	1.7%
African American	19.2%	13.7%
Hispanic	2.6%	2.2%
White	70.2%	81.4%
Multiracial or other	4.8%	–

The primary differences between the two categorizations is that African Americans are over-represented and Whites under-represented in the HST file.

[6] The interactions of race and gender, and gender and free lunch percentage, were also tested, but none were found to be significantly different from zero.

[7] See for example Heller (1999b), Koretz (1990), McPherson and Schapiro (1991, 1998), and Mortenson (1999).

[8] These figures are for all residents age 25 years old and over in the state. The Current Population Survey does not contain a large enough sample to calculate (with sufficiently small standard errors) educational attainment rates for racial/ethnic *and* age group subpopulations in each state. However, the national figures do show large gaps in the attainment (and college enrollment) rates for these groups and across different age cohorts. There is no evidence to indicate that Michigan's pattern is substantially different from the national trends.

[9] Of the 20,138 students who qualified for a scholarship by passing all four MEAP HST tests in the Spring 1999 battery, 687 (3.4 percent) were African American or

Hispanic (Table 1). Only 7.3 percent of the scholarship qualifiers were from schools in the lowest free or reduced lunch quintile (Table 2).